

CLAIMS

1. A method of production of a metallic product with a nanocrystallized surface layer,

5 said method of production of a metallic product with a nanocrystallized surface layer characterized by comprising:

10 (1) subjecting a surface layer of a metallic product to ultrasonic impact treatment impacting it by one or more ultrasonic indenters vibrating in a plurality of directions, then

(2) subjecting the surface layer subjected to the ultrasonic impact treatment to heat treatment at a low temperature to cause precipitation of nanocrystals.

15 2. A method of production of a metallic product with a nanocrystallized surface layer as set forth in claim 1, characterized in that the surface layer of the metallic product subjected to said ultrasonic impact treatment is in an amorphous state.

20 3. A method of production of a metallic product with a nanocrystallized surface layer as set forth in claim 1 or 2, characterized in that said ultrasonic impact treatment is accompanied with mechanical alloying.

25 4. A method of production of a metallic product with a nanocrystallized surface layer as set forth in any one of claims 1 to 3, characterized by making an amorphous phase and a nanocrystal phase copresent in precipitation of said nanocrystals.

30 5. A method of production of a metallic product with a nanocrystallized surface layer as set forth in any one of claims 1 to 4, characterized by shielding the surroundings at the time of said ultrasonic impact treatment from the air.

35 6. A method of production of a metallic product with a nanocrystallized surface layer as set forth in any one of claims 1 to 5, characterized in that the surface layer of said metallic product is comprised of a ferrous metal and said surface layer is subjected to heat

treatment for heating at 100 to 500°C for 15 minutes or more.